CLAIMS

What is claimed is:

1. In a network device having a redundancy platform including an active controller system and a standby controller system, a method comprising:

receiving or generating a routing protocol state change by the active controller system; and

replicating the received or generated routing protocol state change to the standby controller system.

2. The method of claim 1, wherein the routing protocol state change includes a Border Gateway Protocol (BGP) state change, a Routing Internet Protocol (RIP) state change, an Open Shortest Path First Protocol (OSPF) state change, or an Intermediate System-to-Intermediate System Protocol (IS-IS) state change.

3. The method of claim 1, wherein the replicating the received or generated routing protocol state change includes replicating in realtime the received or generated routing protocol state change from the active controller system into the standby controller system.

4. The method of claim 1, further comprising:

receiving or generating a routing protocol message by the active controller system; and

selectively replicating the received or generated routing protocol message in the standby controller system.

5. The method of claim 4, wherein the routing protocol message includes a BGP message, a RIP message, an OSPF message, or an IS-IS message.

6. The method of claim 1, further comprising:

detecting a failure in the active controller system; and

maintaining the same routing protocol state changes in the active controller system prior to failure in the standby controller system.

7. The method of claim 1, further comprising:

performing Internet Protocol (IP) layer 3 service or a Multiprotocol Label Switching (MPLS) service.

8. A network device comprising:

a standby controller system; and

an active controller system to receive or generate a routing protocol state change and to replicate the received or generated routing protocol state change to the standby controller system.

9. The network device of claim 8, wherein the routing protocol state change includes a Border Gateway Protocol (BGP) state change, a Routing Internet Protocol (RIP) state

change, an Open Shortest Path First Protocol (OSPF) state change, or an Intermediate System-to-Intermediate System Protocol (IS-IS) state change.

10. The network device of claim 8, wherein the active controller system is to replicate in realtime the received or generated routing protocol state change to the standby controller system.

11. The network device of claim 8, wherein the active controller system is to receive or generate a routing protocol message and to replicate selectively the received or generated routing protocol message to the standby controller system.

12. The network device of claim 11, wherein the routing protocol message includes a BGP message, a RIP message, an OSPF message, or an IS-IS message.

13. The network device of claim 8, wherein the active controller system is to detect a failure and the standby controller system is to maintain the same routing protocol state changes in the active controller system prior to the failure.

14. The network device of claim 8, wherein the active controller system or standby controller system is to perform an Internet Protocol (IP) layer 3 service or a Multiprotocol Label Switching (MPLS) service.

15. The network device of claim 8, wherein the network device includes a network router, switch, optical switch, bridge, hub, or gateway.

16. In a network device having a redundancy platform including an active controller system and a standby controller system, a method comprising:

receiving or generating a Border Gateway Protocol (BGP) state change by the active controller system; and

replicating the received or generated BGP state change to the standby controller system.

17. The method of claim 16, wherein the replicating the received or generated BGP state change includes replicating in realtime the received or generated BGP state change to the standby controller system.

18. The method of claim 16, further comprising:

receiving or generating a BGP message by the active controller system; and

selectively replicating the received or generated BGP message to the standby controller system.

19. The method of claim 16, further comprising:

detecting a failure in the active controller system; and

maintaining the same BGP state changes in the active controller system prior to the failure in the standby controller system.

20. The method of claim 16, further comprising:

performing Internet Protocol (IP) layer 3 service or a Multiprotocol Label Switching (MPLS) service.

21. In a network device having a redundancy platform including an active controller system and a standby controller system, a method comprising:

receiving or generating a Transmission Control Protocol (TCP) state change by the active controller system; and

replicating the received or generated TCP state change to the standby controller system.

22. The method of claim 21, wherein the replicating the received or generated TCP state change includes replicating in realtime the received or generated TCP state change to the standby controller system.

23. The method of claim 21, further comprising:

receiving or generating a TCP message by the active controller system; and

selectively replicating the received or generated TCP message to the standby controller system.

24. The method of claim 21, further comprising:

detecting a failure in the active controller system; and

maintaining the same TCP state changes in the active controller system prior to the failure in the standby controller system.

25. The method of claim 21, further comprising:

performing Internet Protocol (IP) layer 3 service or a Multiprotocol Label Switching (MPLS) service.

26. A network device comprising:

a standby controller system; and

an active controller system to receive or generate a Border Gateway Protocol (BGP) state change or a Transmission Control Protocol (TCP) state change and to replicate the received or generated BGP state change or TCP state change to the standby controller system.

27. The network device of claim 26, wherein the active controller system is to replicate in realtime the received or generated BGP state change or TCP state change to the standby controller system.

28. The network device of claim 26, wherein the active controller system is to receive or generate a BGP message or a TCP message and to replicate selectively the received or generated BGP message or TCP message to the standby controller system.

29. The network device of claim 26, wherein the active controller system is to detect a failure and the standby controller is to maintain the same BGP state changes and TCP state changes as in the active controller system prior to the failure.

30. The network device of claim 26, wherein the active controller system or the standby controller system is to perform an Internet Protocol (IP) layer 3 service or a multiprotocol label switching (MPLS) service.

31. The network device of claim 26, wherein the network device includes a network router, switch, optical switch, bridge, hub, or gateway.

32. A machine-readable medium that provides instructions, which if executed by a processor, cause the processor to perform the operations comprising:

receiving or generating a routing protocol state change in an active system; and

replicating the received or generated routing protocol state change in a standby system.

33. The machine-readable medium of claim 32, that further provides instructions, which if executed by the processor, cause the processor to perform the operations comprising:

receiving or generating a routing protocol message by the active system; and

selectively replicating the received or generated routing protocol message in the standby controller system.

34. The machine-readable medium of claim 32, that further provides instructions, which if executed by the processor, cause the processor to perform the operations comprising:

detecting a failure in the active controller system; and

maintaining the same routing protocol state changes in the standby controller system as in the active controller system prior to the failure.

35. The machine-readable medium of claim 32, that further provides instructions, which if executed by the processor, cause the processor to perform the operations comprising:

performing Internet Protocol (IP) layer 3 service or a multiprotocol label switching (MPLS) service.

36. A network comprising:

one or more peer nodes; and

a redundant node to communicate with the peer nodes, the redundant node having a redundancy platform including an active controller system and a standby controller system, the active controller system is to receive or generate a routing protocol state change and to replicate the received or generated routing protocol state change to the standby controller system.

37. The network of claim 36, wherein the routing protocol state change includes a Border Gateway Protocol (BGP) state change, a Routing Internet Protocol (RIP) state change, an Open Shortest Path First Protocol (OSPF) state change, or an Intermediate System-to-Intermediate System Protocol (IS-IS) state change.

38. The network of claim 36, wherein the active controller system is to replicate in realtime the received or generated routing protocol state change to the standby controller system.

39. The network of claim 36, wherein the active controller system is to receive or generate a routing protocol message and to replicate selectively the received or generated routing protocol message to the standby controller system.

40. The network of claim 39, wherein the routing protocol message includes a BGP message, a RIP message, an OSPF message, or an IS-IS message.

41. The network of claim 36, wherein the active controller system is to detect a failure and the standby controller system is to maintain the same routing protocol state changes in the active controller system prior to the failure.

42. The network of claim 36, wherein the redundant node is to perform an Internet Protocol (IP) layer 3 service or a multiprotocol label switching (MPLS) service.

43. The network of claim 36, wherein the redundant node includes a network router, switch, optical switch, bridge, hub, or gateway.

44. A network comprising:

one or more peer nodes;

a redundant node to communicate with the peer nodes, the redundant node having a redundancy platform including an active controller system and a standby controller system, the active controller system is to receive or generate a Border Gateway Protocol (BGP) state change or a Transmission Control Protocol (TCP) state change and to replicate the received or generated BGP state change or TCP state change to the standby controller system.

45. The network of claim 44, wherein the active controller system is to replicate in realtime the received or generated BGP state change or TCP state change to the standby controller system.

46. The network of claim 44, wherein the active controller system is to receive or generate a BGP message or a TCP message and to replicate selectively the received or generated BGP message or TCP message to the standby controller system.

47. The network of claim 44, wherein the active controller system is to detect a failure and the standby controller is to maintain the same BGP state changes and TCP state changes as in the active controller system prior to the failure.

48. The network of claim 44, wherein the active controller system or the standby controller system is to perform an Internet Protocol (IP) layer 3 service or a multiprotocol label switching (MPLS) service.

49. The network device of claim 44, wherein the redundant node includes a network router, switch, optical switch, bridge, hub, or gateway.

50. In a network device having an active system and a standby system, a method comprising:

maintaining in realtime routing protocol state changes received or generated by the active system in the standby system;

detecting a failure in the active system; and

resuming operation by the standby controller system using the maintained routing protocol state changes.

51. The method of claim 50, further comprising:

switching over operation of the active system to the standby system such that a peer node does not observe the switchover.

52. The method of claim 51, wherein the resuming the operation by the standby controller system includes:

resuming operation by the standby controller system such that a routing protocol session with active system is not torn down.

53. A network device comprising:

a standby card; and

an active card to store persistent data, session states, and routing information and to replicate in realtime the persistent data, session states, and routing information to the standby card.

54. The network device of claim 53, wherein the active card generates changes to the persistent data, session states, and routing information and replicates the changes to the standby card.

55. The network device of claim 53, wherein the active card receives changes to the persistent data, session states, and routing information from a peer node and replicates the changes from the peer node to the standby card.

56. In a network device having a redundancy platform including an active controller system and a standby controller system, a method comprising:

receiving a routing protocol state change from a peer node by the active controller system;

sending the routing protocol state change to the standby controller system;

receiving a commitment to the routing protocol state change by the active controller system from the standby controller system;

committing to the routing protocol state change in the active controller system; and

sending the commitment to the peer node by the active controller system.

57. The method of claim 56, further comprising:

sending the routing protocol state change to a routing protocol after receiving the commitment from the standby controller system.

58. The method of claim 56, further comprising:

sending the routing protocol state change to a routing protocol after receiving the routing protocol state change from the peer node.

59. A network device comprising:

a standby controller; and

an active controller to receive a routing protocol state change from a peer node, to send the routing protocol state change to the standby controller, to receive a commitment to the routing protocol state change from the standby controller system, to commit to the routing protocol state after receiving the commitment from the standby controller, and to send the commitment to the peer node.

60. The network device of claim 59, wherein the active controller is to send the routing protocol state change to a routing protocol after receiving the commitment from the standby controller.

61. The network device of claim 59, wherein the active controller is to send the routing protocol state change to a routing protocol after receiving the routing protocol state change from the peer node.

62. A machine-readable medium that provides instructions, which if executed by a processor, cause the processor to perform the operations comprising:

receiving a routing protocol state change from a peer node by an active controller system;

sending the routing protocol state change to a standby controller system;

receiving a commitment to the routing protocol state change by the active controller system from the standby controller system;

committing to the routing protocol state change in the active controller system; and

sending the commitment to the peer node by the active controller system.

63. The machine-readable medium of claim 62, that further provides instructions, which if executed by the processor, cause the processor to perform the operations comprising:

sending the routing protocol state change to a routing protocol after receiving the commitment from the standby controller system.

64. The machine-readable medium of claim 62, that further provides instructions, which if executed by the processor, cause the processor to perform the operations comprising:

sending the routing protocol state change to a routing protocol after receiving the routing protocol state change from the peer node.